

of ranged appendages on each side, the uppermost laterodorsal, the lowermost with two appendages to a segment, all springing from flattened tubercles. *Mature caterpillar*: Spines of head slender, tapering throughout; uppermost spines of body much longer than the segments. *Chrysalis*: Frontal tubercles excessively long, ribbon-like, serrate above; antennal joints spined; abdominal prominences terminating in spines.

2. COLAENIS. *Butterfly*: Fore wing distinctly more than twice as long as broad, its cell fully half as long as wing; cell of hind wing open. *Egg*: Unknown. *Caterpillar at birth*: Ranged appendages springing from elevated tubercles. *Mature caterpillar*: Uppermost spines of body scarcely longer than the segments. *Chrysalis*: Frontal tubercles large but not elongate; antennal joints not spined; laterodorsal prominences of abdomen beyond third joint large, compressed, subquadrate.

3. AGRAULIS. *Butterfly*: Fore wing not more than twice as long as broad, its cell much less than half as long as wing; cell of hind wing open. *Egg*:

Tapering from the middle upward. *Caterpillar at birth*: Three principal rows of ranged appendages on each side, all with one appendage to a segment and all springing from elevated tubercles. *Mature caterpillar*: Spines of head stout, scarcely tapering; uppermost spines of body longer than the segments. *Chrysalis*: Frontal tubercles large but not elongate; antennal joints tuberculate but not spined; laterodorsal prominences of abdomen beyond third joint small, conical.

#### Apostraphia Hübner.

*Butterfly*: Palpi very slender, very thinly haired; antennae as long as the body, gradually clavate. Fore wings more than twice as long as broad with well-rounded tip, the cell more than half as long as the wing; cell of hind wings closed, the anal angle rounded. Fore tarsus of ♂ very short; pulvilli and paronychia present. *Egg*: Subcylindrical, tapering considerably only on the upper third, the lateral cells less than twice as broad as high. Laid singly.

### LIFE HISTORIES OF NORTH AMERICAN GEOMETRIDAE. — XXXVI.

BY HARRISON G. DYAR, WASHINGTON, D. C.

#### *Synomila subochrearia* Hulst.

*Egg*.—Elliptical, sides roundedly flattened, truncation rounded, a little oblique, outline in general a little irregular, no end depression. Reticulations circular-hexagonal, rounded, raised, the cell areas forming round pits like a thimble all over the sur-

face. Pale yellowish pink, turning darker. Size .6 × .5 × .4 mm. Laid loose, easily rolling around.

*Stage I*.—Head rounded, erect, slightly bilobed, free, dark dull brown; width .3 mm. Body moderate, normal, translucent sordid whitish, marked with sordid vinous brown.

A greenish dorsal line, dotted on the rather numerous, obscure annulets, grayish in tone, diffuse outwardly with traces of a similar, single, subdorsal line; five broad, transverse, vinous, segmentary bands on joints 5 to 9. Anal feet spreading, the abdominal feet all pale. Tubercles and setae minute, inconspicuous, short, capitate. Thorax dorsally diffusely shaded in brown.

*Stage II.*—Head smoky luteous, darker except in two lines from the clypeus on each lobe; width .4 mm. Body normal, moderate, sordid luteous with five broad, transverse, vinous, segmentary bands as before, united by numerous fine, evenly spaced, longitudinal lines of the same color, fainter at the ends, addorsal, subdorsal, lateral, etc. Tubercles whitish with short, capitate setae also whitish, the enlarged ends looking like dots on the body. Segments finely annulate.

*Stage III.*—Head rounded bilobed, brown, pale mottled, a pale curved line on each lobe above; dotted by the white capitate setae; width .6 mm. Body whitish with fine red-brown lines, slightly waved, about as wide as the spaces, blotched on the diffuse transverse bands of joints 5 to 9. Feet dark. Finely annulate; appears dotted by the white capitate setae.

*Stage IV.*—Head rounded, erect, rather strongly bilobed, brown, black on the face, pale, dark mottled on sides and vertex; setae pale, short, capitate; width .85 mm. Body moderately robust, the ends contracted, normal, segments rather numerous annulate especially at the ends; subventral fold ridged, prominent on the posterior edges of the segments. Tubercles i and ii well sepa-

rated, ii on a slightly prominent annulet. Nearly uniformly entirely dark brown; segments a little lighter patched dorsally with traces of a pale, narrow, dorsal line, on each side of which are rather irregular, faintly traced, blackish markings intersegmentally, forming a broad, geminate dorsal band. Feet short, dark; setae with pale capitate tips, short. Subventral ridge marked and blotched in pale. After being in this stage two weeks the larvae were thick and robust, tapering from joint 5 to the small head. Dark brown, finely annulate, shaded in paler on the back; subventral fold pale and blotched broadly in pale centrally on the segments. Marks all obscure.

*Stage V.*—Head rounded bilobed, erect or with the apex advanced, clypeus depressed. Brown-black, apices of lobes lighter brown mottled; setae short, white, capitate; width 1 mm. Body robust, attenuated somewhat before, finely annulate. Dark brown-black, variegated with obscure tessellated markings in lighter brown in dorsal, diamond-shaped patches, terminated in obscure black X-marks in the incisures and a black subdorsal line. All the markings are clouded, faint and mottled. Subventral fold prominent. Setae short, pale, capitate. The dorsal tessellations are palest on joints 5 and 6, somewhat ring shaped on joint 11.

Larvae from Golden, Colorado, eggs July 7th. The larva grew slowly and died October 27th, but seems to have been in the last stage. It is remarkable, however, that the capitate setae should persist so long. The larva was fed on Polygonum; natural food-plant not determined.

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